Pesticide and Fertilizer Facility Operations Checklist

Ronald T. Noyes, P.E.
Extension Agricultural Engineer Oklahoma State University

Dennis R. Gardisser, P.E.
Extension Agricultural Engineer University of Arkansas

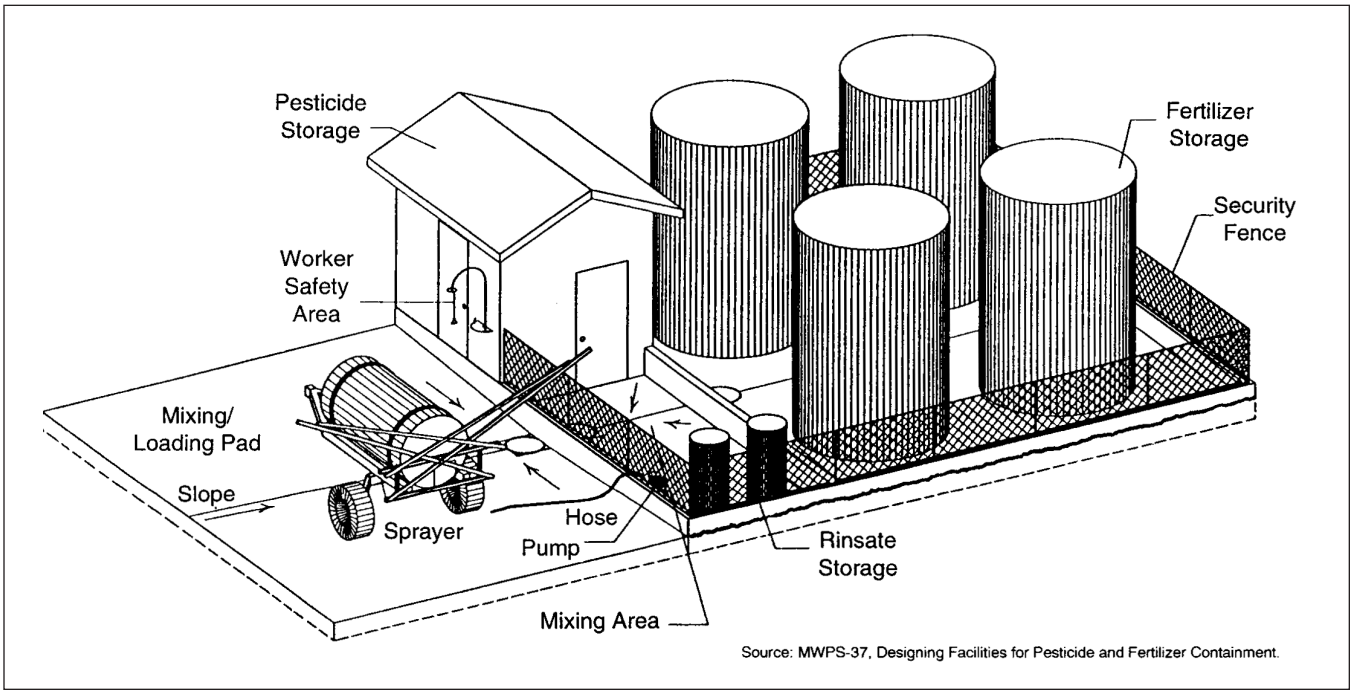
Dennis K. Kuhlman, P.E.
Extension Agricultural Engineer Kansas State University

The following checklist is a guide to help assess the environmental integrity and functional operation of an existing or planned pesticide or fertilizer facility. While reviewing the facility, identify areas that should be improved. Completing a thorough analysis using this checklist will help become a responsible environmental steward. These management recommendations list some items required by law and others that are considered Best Management Practices (BMP's). Check the items that one is currently doing. Circle those items that still need attention.

Housekeeping

The appearance of an operation is a direct reflection of theprofessional business management to customers, neighbors, the general public, and regulatory officials. Good housekeeping creates a positive impression while disorganized, unclean, or generally sloppy appearances may indicate potential problem areas.

- Keep a **spill cleanup kit** near the mixing/loading area. Use loose absorbent materials when possible to simplify disposal. Loose contaminated materials can be reapplied at or below label rates to listed targets.
- Clean up pesticide leaks or spills immediately.
- Clean mixing, loading and storage areas after each use.
- Place a plastic bucket, pan or other collection container under all hose connections to keep pesticides or fertilizers from dripping on the pad.
- Inspect tanks monthly for cracks, leaks, sludge, and rust.
- Cover sumps when not in use to keep out trash and dirt.
- Use collected storm water as make-up water or pump out if pad is clean.
- Use dry-break connectors on those hoses used frequently.
- Mix only the amount of pesticide needed.
- Segregate rinse water by crop so that it can be used as mix water in the future.
- Store pressure-rinsed or triple-rinsed containers in a dry, secure area until ready for disposal.



Mediium sized pesticide storagte, containment, and mixing/loading facility perspective.

- Rinse container caps and wash the outsides of containers to remove pesticide residues.

Storage and Handling

Prevention of air, surface, and ground water contamination should be a high priority during the operation of a storage and handling facility.

- Use closed transfer systems for worker safety when handling pesticides.
- Store pesticides and fertilizers in separate containments **as required by law.**
- Post the correct warning and hazard signs in storage facilities.
- Place fire extinguishers near storage entrances. Check extinguishers every six months for proper charge.
- Store dry pesticides above liquid pesticides, or store separately.
- Use metal shelving with a front retainer lip on each shelf.
- Provide an inventory of each type and quantity of all chemicals to the local fire department and Local Emergency Planning Committee (LEPC). Update the inventory when significant changes in quantity or type of chemical are made.
- File a detailed diagram of storage inventory and Material Safety Data Sheets (MSDS) locations with local fire fighting personnel and police.
- Manually operate all containment pumps unless authorized otherwise by state regulation.
- Place each small volume container (up to five gallons) in a separate compatible containment after opening or when storing for more than one year.
- Use tarps, plastic sheeting, or catch pans under fertilizer conveyor transfer points to contain leaks and spills.
- Keep all pesticide containers sealed.

Dry Fertilizer

Fertilizers and pesticides must be stored in separate containment areas **by law.**

- Store all fertilizer products under roof.
- Divert storm water away from the fertilizer storage area.
- Collect contaminated rainwater inside the containment aea and apply as make-up water.
- Recover and use spilled products immediately.
- Contain and use fugitive dust from storage and transfer areas on appropriate sites.
- Place dry fertilizer storage and handling areas inside water-tight containment diking.

Pesticides

All pesticides must be stored in a separate area isolated from animal feed, grain, fertilizer, or other materials to prevent possible contamination.

- Keep flammable or combustible materials segregated from all ignition sources.
- Store all bulk chemicals under roof inside a diked, impermeable containment area.
- Keep storage area locked.
- Pump clean rainwater from containment area or collect and store rainwater from diked areas for future applications.
- If the pesticide containment area is outside, develop plans to roof the storage and mixing/loading pads to eliminate storm water accumulation.
- Design open sided roof structures with poles set beyond the pad. Roofs should provide a 30 degree overhang from the roof edge to the edge of the pad to minimize storm water from blowing in. Add side and end wall panels along the roof support poles during the off-season to keep storm water out.
- Design roofed containment areas to hold at least 110 percent of the largest tank volume, plus the volume displaced by all other tanks and equipment.
- Design containment areas not under roof to hold 125 percent of the volume of the largest tank, the base volume of all tanks in the containment area, freeboard (six inches minimum), and rainfall amounts as prescribed by state regulations (usually a 25-year storm. See MWPS-37 Handbook for 25-year storm figure).
- Locate all transfer pumps, pipes, hoses, and valves above ground in a containment structure for easy inspection. Install pumps and electrical equipment above the containment liquid level for safety.
- Do not run piping through walls or dikes.
- Check the tank storage area for leaks and spills daily during the application season, then bi-weekly during the off-season.
- Document primary inspection factors (time, date, place, conditions, inspector, etc.) in a permanent log book.
- Repair leaks and clean contaminated pads immediately. Chemicals damage concrete or steel surface coatings or the concrete or steel rapidly.
- Clean up spills and dispose of the waste immediately. Unprotected concrete absorbs volatile pesticides **within seconds.** Fertilizer corrodes unprotected steel quickly.
- Equip containment pad with a small collection sump (5-10 gallon cylindrical stainless steel sump preferred), pumping system, and holding tanks.
- Do not construct sumps with **underground piping.**
- Place pesticide mini-bulk tanks in a storage containment area to avoid accidental run-off or drainage from leaks.
- Keep all packaged and bulk chemicals inside a secure (locked) building designed with at least 6-inch depth internal containment and an impermeable floor to hold water or other chemicals used in fire extinguishing.

Mixing-Loading Areas

Mixing/loading areas should be equipped for personnel safety and protection of the containment pad against drips and leaks. Mixing/loading areas can be in a separate containment area,or on a containment pad with stored products and rinsates.

- Mix/load areas must have emergency eye wash and shower facilities. Freeze protection plumbing should be used in freezing climates.
- Ventilate enclosed mixing areas with at least six air changes per hour for pesticide handling. Use fume exhaust hoods over mixing tables or sinks.
- Display hazardous chemicals, non-smoking signs and other appropriate signs prominently at all building entrances and exits.
- Label all product and rinsate storage by content.

- Place mixing and transfer tanks and pump systems within a containment area that includes a small sump (5-10 gallon) without a drain.
- Design mix/load pad containment systems to handle 110 percent of the volume of the largest transport truck or applicator vehicle if under roof, or 125 percent plus volumes displaced by equipment and tank bases, and freeboard if not roofed.
- Transfer or load all products over a containment pad built with a small (5-10 gallon) collection sump. Do not run piping through walls and dikes.
- Pesticide and fertilizer products can be handled using mix/load equipment in a common containment area.
- Pesticides must be stored separate from fertilizer andall other products.

Rinsate and Wastewater Handling and Reuse

Immediate reuse of rinsates on label target sites or intended crops is good management. Mixed rinsates that can not legally be applied according to the pesticide labels are considered hazardous waste.

- If possible, rinse spray equipment at spray sites.
- Thoroughly clean rinsate tanks used for different crops or non-compatible chemicals.
- Wash sprayer exteriors in the field to eliminate contaminated mud cleanup on pad. Use different field locations to wash vehicles each time to prevent concentration buildup in one location.
- Do not run wastewater from mixing sinks or sumps into public sewer drains, storm sewers, or septic systems.
- Septic systems with leach fields should **never** be used for disposal of any liquid that **may** contain agrichemical contaminants.
- Apply rinsate from rinsing plumbing/boom equipment while at the target site to avoid rinsing at the facility.
- If spray equipment is rinsed at the mix/load facility, collect and segregate rinsate in holding tanks marked for reuse according to crop to avoid pesticide cross-contamination.
- Clean mix/load pads before washing off spray equipment. Collect exterior rinsate and spray on an approved target, even though external rinse water has been defined as non-hazardous. Clean pad immediately after washing down each time.
- Immediately apply liquids that are collected from mix/load pad or storage containment sumps to an approved target (for the job the rinsate was generated from if practical), or temporarily store it in above-ground tanks until it can be used on another job requiring that chemical.
- Use stored rinsate and storm water immediately in product mixes at one part rinsate to four parts clean water.

NOTE: Check product label before using rinsate for makeup water for all products. Some pesticides, such as ROUNDUP, may be neutralized within hours of mixing by hard water (high pH), dirty waste water and even dilute rinsate of the same product.

Rinsates which contain mixed chemicals that can not be legally applied (per label) to an appropriate target site are considered hazardous waste according to state and federal regulations, and must be disposed of as hazardous waste.

Fuel Storage

Fuel must be stored in a separate containment from pesticide and fertilizer storage containment areas. Fuels are highly flammable and increase fire risk damage. Fuel should not be stored close to pesticide and fertilizer storage.

- Instruct employees not to smoke or eat while handling fuels.
- Locate all new fuel tanks above-ground in separate fuel containments, at least 100 feet from pesticide storage buildings.
- Equip all new, underground petroleum tanks with leak detection, monitoring and corrosion protection systems.
- Document design specifications and periodic fuel volume reconciliation. Maintain these documents in a permanent file as required by state and federal regulations.
- All underground storage tanks should be registered, management procedures documented, and records maintained according to state and federal laws.
- Protect fuel and chemical product tanks, piping, and dispensers from vehicle collision damage using structural fencing or guard posts.
- Post appropriate National Fire Protection Association (NFPA) “Fuel Warning” and “No Smoking” signs or placards at fuel storage facilities.
- Place fire extinguishers near the fuel storage area.

Site Security

Good security measures are the best insurance against problems resulting from accidental or intentional damage of the facility and surrounding property by unauthorized personnel. A modest investment of resources and effort can prevent a substantial loss to the operation.

- Install a security fence and lock all storage buildings as a means of preventing unauthorized property access.
- Install lighting in all product storage and handling areas.
- Provide automatic proximity sensor-activated security lights to protect workers and to minimize vandalism.
- Lock all gates and doors when the facility is unattended or when areas are not occupied by employees.
- Secure all valves (including site gauge valves) on bulk product tanks with locks.
- Equip sight gauges on bulk storage tanks with bottom valves that are normally locked off.
- Lock out all containment area sump pumps.
- Seal off or eliminate containment drain lines.
- Equip application equipment containing products stored overnight with locked discharge valves.

Personnel Hygiene and Safety

Worker hygiene and safety must be a high priority at pesticide facilities. Each worker who is required to handle chemical products must be properly trained in how to handle chemicals and operate transfer or mixing equipment safely. All workers must be able to read and understand label safety instructions. Specific training should include the following:

- Instruct employees to wash hands thoroughly with soap and water before using the bathroom after handling pesticides, fertilizers, or fuels.

- Instruct employees not to smoke, eat, or drink while handling pesticides, fertilizers, or fuels.
- Annually train all employees in the proper use of personal protective equipment (PPE) for chemical handling.
- Provide and use face shields or goggles, rubber aprons, long-sleeved shirts, rubber gloves, boots, and other appropriate PPE when loading and mixing pesticides.
- Use closed transfer systems for all pesticide and fertilizer handling safety.
- Use proper safety equipment, clothing, and laundry practices to protect personnel and their families.
- Do not mix pesticide-contaminated clothing with family clothing. Use a separate washer and dryer for pesticide-use clothing.
- Use strong detergents and hot (140°F) water for washing. Run empty washer with detergent and hot water cycle to clean after washing contaminated clothing.
- Hang clothing outside in direct sunlight and wind to dry.
- Material Safety Data Sheets (MSDS) for all hazardous materials (i.e. pesticides, ammonia, acids) used at the facility should be available for all workers; supply them to local fire department and LEPC.
- Design office and non-storage areas with separate exit doors from pesticide storage rooms.
- Ventilate enclosed pesticide storage areas with at least six air changes per hour using explosion proof electrical control wiring and fan motors.
- Locate emergency shower and eye flush fountains close to chemical handling areas; an alarm should trigger when used to alert others of an emergency.
- Install a telephone with a list of emergency phone numbers near pesticide storage buildings and in your office.
- Do not store pesticides that must be hand lifted over 66 inches above the floor.
- Develop, practice, and maintain an emergency action plan for pesticide accidents and emergencies. Include local support groups (fire, police, EMT) so the entire community can be prepared for an emergency.

Regulation Compliance Documentation

File and maintain written documentation of environmental compliance actions and activities to prove you are complying with regulations.

- File construction, environmental, and other permits for easy retrieval.
- Review permit conditions semi-annually for compliance.
- File underground storage tank registration, certification, and leak test results for easy retrieval.
- Make sure all pesticide licenses and certifications are current.
- Develop a schedule for renewing permits, licenses, certifications, and other documents on time and keep them current.
- Document and maintain records of safety training, safety and professional meeting subjects and attendance, and emergency response drills for continuing education unit (CEU) credits.
- Make sure your employees sign the appropriate form(s) indicating they have attended hazardous material training sessions and that they understand all applicable MSDS's. Maintain copies of in a permanent records file.
- Develop and use a written emergency action plan that includes storage building contents and storage patterns, site plans, emergency and accident procedures, hazardous communications, emergency phone numbers, special fire fighting procedures, fire fighting water runoff control, and locations of utility shut-offs.

SARA Title III Reporting

- Maintain accurate inventory and production records.
- Organize and label product storage to facilitate Superfund Amendments and Reauthorization Act (SARA) Title III documentation.
- File all notifications required under SARA Title III with the appropriate agencies. Check with the state pesticide coordinator if you are unsure of all requirements.
- Check to see if you are subject to Sections 311 and 302 (emergency response plan and notification) reporting and if you are required to submit an Emergency and Hazardous Chemical Inventory Form (Tier I or Tier II forms) by October 17 of each year.
- Maintain copies of all required reports at the facility.

Water Supply

Regardless of the facility water source, specific measures need to be taken to protect all area water supplies and water sources from accidental contamination.

- Do not mix or load chemicals within 50 feet of a water well, or within 100 feet of a pond, lake, stream, or river.
- Protect on-site wells and other water sources against back-siphoning by using air gaps, approved back flow double check valves, or other approved anti-siphoning safety mechanisms.
- Elevate and curb well heads to prevent spills or surface runoff from entering wells.
- Analyze on-site well samples each year for the type of chemicals handled at your facility.
- Know the location of all private and public water supply wells near the facility (at least within one-half mile).

Much of this information is common sense. However, this checklist should make one more aware of his or her responsibilities and help protect him or her from liability and legal actions. This publication is **not** intended to be a **complete** listing, but simply a checklist of the more common items that should be done.

A well-prepared business and operational plan may mean the difference in the business's viability. **Documentation listed in this checklist is especially important.** Often good and complete documentation spells the difference between a violation, a warning, or praise.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert E. Whitson, Director of Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 20 cents per copy. 0507